

**Amendments to the Claims:**

This listing of claims dated August 13, 2004 will replace all prior versions, and listings, of claims in this application:

**Listing of Claims:**

1 (amended). A method of correlating a signal comprising the steps of:

- (a) selecting a plurality of samples of said signal;
- (b) modifying a first butterfly transform with a first twiddle factor;
- (c) transforming said samples with said modified first butterfly transform;
- (d) modifying a second butterfly transform with a second twiddle factor;
- (e) transforming an output of said of said first butterfly transform with said modified second butterfly transform;
- (f) modifying a third butterfly transform with a third twiddle factor;
- (g) transforming an output of said second butterfly transform with said modified third butterfly transform;
- (h) selecting a largest output of said third butterfly transform; and
- (i) repeating steps ([a] b) - (h) for a plurality of values of said first, said second, and said third twiddle factors.

2 (original). The method of claim 1 wherein a value of said first, said second and said third twiddle factors are selected from a twiddle factor set comprising values 0,  $\pi/8$ ,  $\pi/4$ , and  $3\pi/8$ .

3(original). The method of claim 1 wherein the step of selecting a largest output of said third butterfly transform comprises the steps of:

- (a) storing a first output of said third butterfly transform;
- (b) comparing a second output of said third butterfly transform to said stored first output; and
- (c) replacing said stored first output with said second output if said second output is larger than said stored first output.

4 (amended). A method of correlating a signal comprising the steps of:

- (a) selecting a plurality of samples of said signal;
- (b) modifying said samples with a function of a first twiddle factor;
- (c) transforming said samples with a first butterfly transform;
- (d) modifying an output of said first butterfly transform with a function of a second twiddle factor;
- (e) transforming said modified first butterfly output with a second butterfly transform;
- (f) modifying an output of said second butterfly transform with a function of a third twiddle factor;
- (g) transforming said modified second butterfly output with a third butterfly transform;
- (h) selecting a largest output of said third butterfly transform; and
- (i) repeating steps ([a] b) - (h) for a plurality of values of said first, said second, and said third twiddle factors.

5(original). The method of claim 4 wherein a value of said first, said second and said third twiddle factors are selected from a twiddle factor set comprising values 0,  $\pi/8$ ,  $\pi/4$ , and  $3\pi/8$ .

6(original). The method of claim 4 wherein the step of selecting a largest output of said third butterfly transform comprises the steps of:

- (a) storing a first output of said third butterfly transform;
- (b) comparing a second output of said third butterfly transform to said stored first output; and
- (c) replacing said stored first output with said second output if said second output is larger than said stored first output.

7(original). A correlator for a direct sequence spread spectrum signal comprising:

- (a) a weighting device to modify a sample of said signal as a function of a first twiddle factor;
- (b) a first butterfly processor transforming a pair of modified samples of said signal;
- (c) a second weighting device to modify an output of said first butterfly processor as a function of a second twiddle factor;
- (d) a second butterfly processor transforming said modified output of said first butterfly processor;
- (e) a third weighting device to modify an output of said second butterfly processor as a function of a third twiddle factor;
- (f) a third butterfly processor transforming said weighted output of said second butterfly processor;
- (g) a largest modulus selector to identify a largest output of said third butterfly processor; and
- (h) a twiddle factor indexer successively varying a value of at least one of said first, said second, and said third twiddle factors.

8(original). The apparatus of claim 7 wherein said twiddle factor indexer varies a value of at least one of said first, said second and said third twiddle factors with one of a value selected from a twiddle factor set comprising values 0,  $\pi/8$ ,  $\pi/4$ , and  $3\pi/8$ .

9(original). The apparatus of claim 7 wherein said largest modulus selector comprises:

- (a) a comparator for comparing a first and a second output of said third butterfly processor; and
- (b) a register for storing a largest of said first and said second outputs of said third butterfly processor.

10(original). A correlator for a direct sequence spread spectrum signal comprising:

- (a) a first butterfly processor transforming a pair of samples of said signal as a function of a first twiddle factor;
- (b) a second butterfly processor transforming an output of said first butterfly processor as a function of a second twiddle factor;
- (c) a third butterfly processor transforming an output of said second butterfly processor as a function of a third twiddle factor;
- (d) a largest modulus selector to identify a largest output of said third butterfly processor; and
- (e) a twiddle factor indexer varying in succession a value of at least one of said first, said second, and said third twiddle factors.

11(original). The apparatus of claim 10 wherein said twiddle factor indexer varies a value of at least one of said first, said second and said third twiddle factors with one of a value selected from a twiddle factor set comprising values 0,  $\pi/8$ ,  $\pi/4$ , and  $3\pi/8$ .

12(original). The apparatus of claim 10 wherein said largest modulus selector comprises:

- (a) a comparator for comparing a first and a second output of said third butterfly processor; and
- (b) a register for storing a largest of said first and said second outputs of said third butterfly processor.